**Kreutzer, R. (1993). Monte Vista High School Cancer Cluster Investigation - Danville, California., California Department of Health Services, Environmental Health Investigations Branch.**

SUMMARY

The Cancer Surveillance Section (CSS) and the Environmental Health Investigations Branch (EHIB) of the California Department of Health Services (DHS) along with the Contra Costa County Department of Health Services, investigated a reported excess of cancer cases in the 1985 graduating class of Monte Vista High School (MVHS) in Danville, CA. Presented here is a summary of the findings of the investigations. The complete reports are contained in appendices to this summary.

Background:

While organizing their five-year reunion, members of the class of 1985 became alarmed about the number of cancer cases among their former classmates. The local newspaper was contacted, and interviews with some of the cases and other graduates were published in the spring of 1991. This caused considerable concern in the community and resulted in numerous calls to the county and state health departments.

As a result of the publicity, 17 cases among members of graduating classes from 1981-87, including the 7 cases from the MVHS class of 1985, were reported to DHS. This group consisted of young adults diagnosed with cancer both within and outside of California, as well as contemporaries of MVHS graduating classes who did not attend the high school.

Cancer Surveillance Section Evaluation of cancer Incidence (Appendix A):

An initial assessment by CSS suggested that the seven cases occurring in the 1985 graduating class were significantly more than the one case that would be expected for a class of approximately 350 students.

An investigation was undertaken to further examine the observed excess. The objectives were to determine 1) If the cancer excess was confined to the class of 1985; 2) If the cancer excess was a manifestation of a school cohort excess or a residential cohort excess; 3) If there was evidence of a cancer excess for the same age group (15-24) in other parts of Danville and; 4) If there was evidence of a cancer excess in other age groups (0-14 and 25-34 year olds) in the same geographic area.

Methods:

CSS linked lists of graduating seniors and/or copies of senior class entries from school yearbooks for the years 1981-88, with cancer incidence data from 1981 to 1991 in the Northern California Cancer Center Cancer Registry (which includes residents of five Bay Area counties since 1973, and Santa Clara, Santa Cruz, Monterey and San Benito counties since 1988).
CSS examined cancer rates among all 15-24 year olds in the five census tracts of the MVHS

attendance area (3461.01, 3461.02, 3462.01, and 3551.03) as well as the five census tracts adjacent to the MVHS attendance area (3440, 3452.01, 3452.02, 3511, 3521.01) for 1982-88.

CSS also examined cancer rates among persons 0-14 and 25-34 years of age, respectively, in the 5 census tracts of the MVHS attendance area.

Results:

CSS identified 26 cases. Based on the assessment of information on the cases, the case definition for inclusion in the investigation was defined as a cancer diagnosis from 1981 to 1991 between the ages of 15 and 24, in a person who either attended MVHS between 1981-88, or who lived in the MVHS attendance area during the time period 1982-88. There were 23 cases meeting the definition. There were ten different types of cancer seen among the 23 cases, including those that most commonly occur among young adults. The cases included: cancer of the testis (4), Hodgkins disease (5), melanoma (5), cancer of the ovary (2), bone (2), brain (1), salivary gland (1), breast (1), leukemia (1), and non-Hodgkins lymphoma (1).

The data suggested that none of the other MVHS graduating classes between 1981-88 had an excess of cancer. However, there were two limitation of this process: 1) cancer cases diagnosed among former MVHS students residing outside of the above-mentioned geographic area who were not reported to DHS would be missed; and 2) graduates from the 1986 and later graduating classes are younger than the 1985 graduating class and therefore have not contributed as much follow-up time.

CSS found an excess of cases among 15-24 year olds in the MVHS attendance area. Since there was insufficient information on MVHS attendance in the CSS files, it was not possible to determine if all these cases were associated with the school or if they represented a separate cancer excess.

No excess of invasive cancer was identified in the fie census tracts adjacent to the attendance area, nor in the age groups 0-14 and 25-34 in the MVHS attendance area tracts.

Environmental Health Investigations Branch Survey (Appendix B):

With these results, CSS referred the problem to the Environmental Health Investigations Branch (EHIB) to see whether there were common environmental factors among the cases.

Methods:

EHIB examined the residential and school attendance histories of all cases in order to verify findings from the CSS study to validate whether 1) classes other than the class of 1985 also had more cancer than expected; and 2) the cancer excess appeared to be more strongly associated with the attendance area or the school. In addition, there were unanswered questions from cases, parents, and residents about shared exposures that might explain the cancer occurrences. Figure 1 illustrates the status of CSS's 23 identified cases.

The Environmental Health Investigations branch mailed a questionnaire to 22 identified cases who met all case criteria. After more careful assessment, one of the 23 cases failed to meet the CSS case definition. Detailed questions were asked about residential history, school attendance history, family history of cancer, other exposures, work, hobbies, health problems, and other behaviors.

Survey Results:

Eighteen questionnaires (82%) were returned to DHS. Sixteen (89%) of the questionnaire respondents reported attending MVHS for at least part of their high school education. Twelve graduated from MVHS. With more precise information from the questionnaire regarding MVHS attendance, it was possible to examine the number of cases per graduating class and determine whether there were excess cases for each year. In spite of having learned about the additional cases who attended MVHS, DHS found that only the class of 1985 demonstrated a cancer excess. This confirmed the preliminary calculations of CSS.

DHS examined other factors, exposures, and behaviors for all the cancer cases and then compared the class of 1985 cases to all others. All cases demonstrated a great deal of residential mobility. The average number of residences reported by cases was 6.5. MVHS 1985 cases lived in the attendance area an average of 15.2 years, compared to 7.3 years for other cases. There were no differences in residential remodeling, home pesticide use, or proximity to transformers and high power lines. Six of the 18 cases attended Los Cerros Junior High School at the time of a fire that occurred in 1982. Family members with cancer were reported by 16 cases, but there was nothing unusual in the pattern of the cancers described. Alcohol use, smoking behavior, and sun tanning behaviors were not suggestive as possible etiologic factors. There were no unusual occupational or avocational exposures to cases or parents.

EHIB has conducted a thorough investigation of the MVHS cases. However, there are some inherent limitations in the results of the study. The data obtained are limited because 1) questionnaires were not returned for four of the 22 people identified with cancer; 2) it is possible that all cases may not have been identified through the processes of self-report and tumor registry searching; 3) the information on exposures is based upon the memory of the responder, which may not be complete; and 4) the total number of cases (22) is too small to have a high degree of statistical power. Therefore, only the very unusual or excessive exposures could be discovered through this investigation.

Conclusion:

DHS has confirmed an excess of cancer in young adults who attended Monte Vista High School and graduated in 1985.

No other classes appeared to have an excess. Cancer rates in areas outside of the school attendance area were not elevated.
Other Danville age groups (0-14, 25-34) did not have elevated cancer rates. Although it is difficult to completely reconstruct the school environment for the class of 1985 a school inspection in 1992 uncovered no carcinogenic exposures )Appendix C). The questionnaire

demonstrated no exposures or personal attributes or behaviors that were shared by most of the cases in the class of 1985.

Although the class of 1985 cases lived in the attendance area longer than the other cases, no residential risk factors for cancer were identified. Other age groups in the attendance area did not have elevated cancer rates. No exposures that would be selective for 15-24 year olds were identified through the questionnaire or other phases of the investigation.

Students and parents expressed concern about a possible exposure in the school which would have caused the cancers. Four factors argue against the school as a source for a carcinogenic exposure that would affect most or all cases. First, only the class of 1985 experienced the cancer excess in spite of sharing the school environment for different periods of time with six other classes. It is improbably that an exposure would be selective for members of the class of 1985. Second, an industrial hygienist, the county health officer, and a DHS representative found no suggestion of unusual or excessive carcinogenic exposures during the school inspection in 1992. Third, there were no unusual or excessive carcinogenic exposures reported by the respondents to the DHS questionnaire. Fourth, given the variety of cancer sites and types among the former students, it is unlikely that the same factor would cause each cancer. Different cancers are thought to represent essentially different diseases with different causes and natural histories. For example, lung cancer is though to have different causes than breast cancer or brain cancer or leukemia. And, no single agent is known to cause or increase risk for all of them.

The DHS investigators share the frustration with scientific limitations expressed by some of the cases and their parents during the investigation. The investigation did not uncover any unusual cancer-causing exposures shared by the group of young adults. Perhaps reassuring to other parents, there is no evidence that graduating classes other then 1985 have a cancer excess and no environmental factors have been identified in the Monte Vista School environment to set it apart from any other school in California. DHS has no other studies pending, and as a result of its investigation, does not recommend further study at this time.